

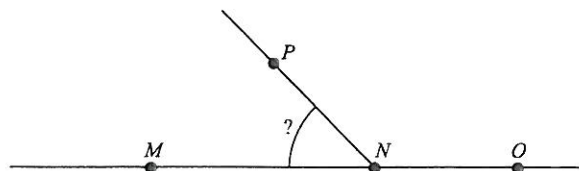
PLANE GEOMETRY

These questions will test your knowledge of operations involving plane figures such as circles, triangles, rectangles, parallelograms, and trapezoids; angles, parallel lines, and perpendicular lines; perimeter, area, and volume; and simple three-dimensional figures. Plane Geometry questions make up a considerable portion of the more difficult math tested on the ACT Mathematics Test. Approximately 23 percent of the questions will fall under this category.

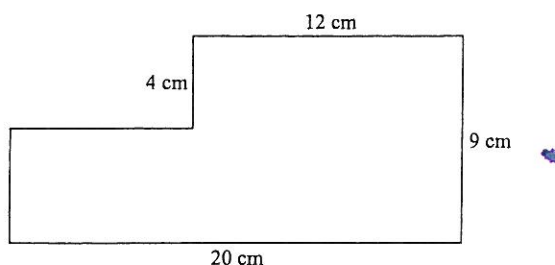
Difficulty Level: Easy

1. What is the volume, in cubic inches, of a cube whose edges each measure 3 inches in length?
A. 9
B. 12
C. 18
D. 27
E. 81

2. In the figure below, M , N , and O are colinear, the measure of angle MNP is $3x^\circ$, and the measure of angle ONP is $6x^\circ$. What is the measure of angle MNP ?

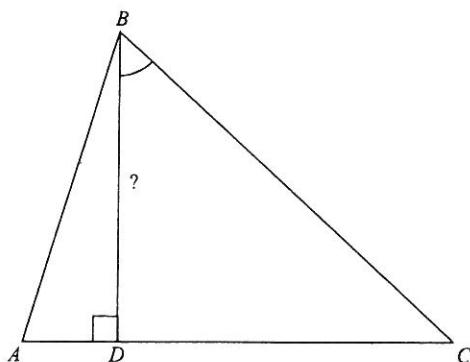


- F. 18°
G. 20°
H. 60°
J. 120°
K. 162°
3. For the polygon below, the lengths of 2 sides are not given. Each angle between adjacent sides measures 90° . What is the polygon's perimeter, in centimeters?



- A. 45
B. 58
C. 87
D. 90
E. 180

4. The area of $\triangle ABC$ below is 40 square inches. If \overline{AC} is 10 inches long, how long is the altitude \overline{BD} , in inches?

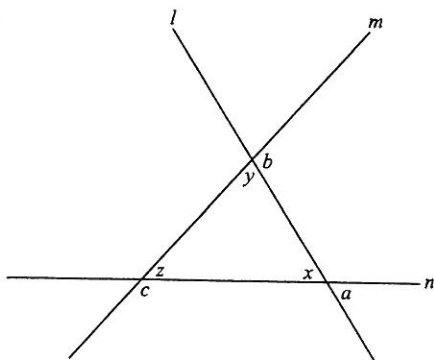


- F. 4
 - G. 6
 - H. 8
 - J. 10
 - K. 12
5. What is the area, in square inches, of a trapezoid with a height of 6 inches and parallel bases of 9 inches and 7 inches, respectively?
- A. 24
 - B. 32
 - C. 48
 - D. 96
 - E. 378

Difficulty Level: Medium

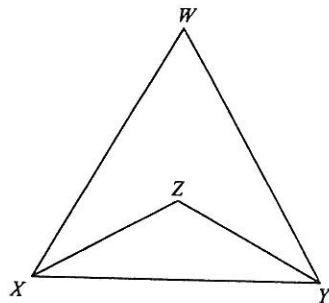
6. The area of a wheel is 78.5 inches. About how many revolutions does one of these wheels make traveling 100 feet (1,200 inches) without slipping?
- F. 12
 - G. 15
 - H. 38
 - J. 100
 - K. 942

7. In the figure below, if $a = 140$, what is the value of $b + c$?



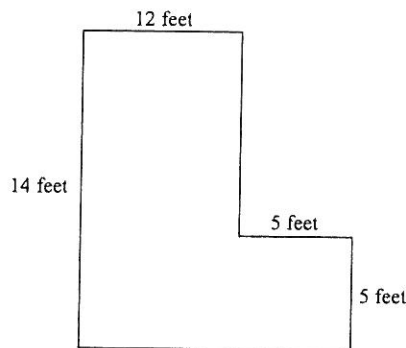
- A. 320°
- B. 220°
- C. 180°
- D. 140°
- E. 50°

8. Triangles WXY and ZXY , shown below, are isosceles with base \overline{XY} . Segments \overline{XZ} and \overline{YZ} bisect $\angle WXY$ and $\angle WYX$, respectively. Which of the following angle congruences is necessarily true?



- F. $\angle WXY \cong \angle WYZ$
- G. $\angle WXZ \cong \angle WYX$
- H. $\angle WXZ \cong \angle XYZ$
- J. $\angle WYZ \cong \angle XWY$
- K. $\angle XYZ \cong \angle XWY$

9. Mandy plans to carpet the entire floor of her bedroom. The floor is flat and all adjacent sides meet at right angles, as shown below. Mandy can purchase 8-foot \times 12-foot pieces of carpet on sale. What is the minimum number of pieces of carpet that she must purchase in order to carpet her bedroom floor?



- A. 1
 - B. 2
 - C. 3
 - D. 4
 - E. 5
10. Triangle ABC is similar to triangle XYZ . \overline{AB} is 5 inches long, \overline{BC} is 8 inches long, and \overline{AC} is 3 inches long. If the longest side of $\triangle XYZ$ is 20 inches long, what is the perimeter, in inches, of $\triangle XYZ$?
- F. 16
 - G. 28
 - H. 40
 - J. 64
 - K. 88

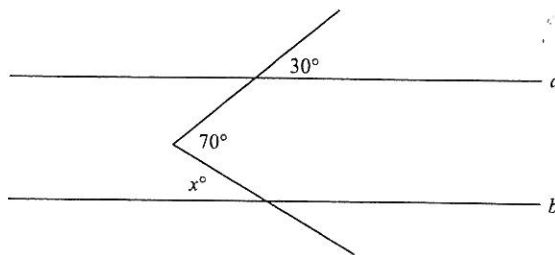
Difficulty Level: Hard

11. The noncommon rays of 2 adjacent angles form a straight angle. The measure of one angle is 3 times the measure of the other angle. What is the measure of the smaller angle?
- A. 40°
 - B. 45°
 - C. 50°
 - D. 55°
 - E. 60°

12. A square has sides that are the same length as the radius of a circle. If the circle has a circumference of 64π square units, how many units long is the perimeter of the square?
- F. 8
G. 16
H. 32
J. 128
K. 256

13. In a certain rectangle, $PQRS$, angle QPS and angle PSR are right angles. If the length of line \overline{PR} is 34 units and the length of line \overline{PS} is 30 units, what is the length of line \overline{RS} ?
- A. $\sqrt{30}$
B. 16
C. $\sqrt{34}$
D. $2\sqrt{514}$
E. 14

14. In the figure below, lines a and b are parallel and angle measures are as marked. If it can be determined, what is the value of x ?



- F. 30°
G. 40°
H. 55°
J. 70°
K. Cannot be determined from the given information.
15. Which of the following degree measures is equivalent to 3.75π radians?
- A. $2,700^\circ$
B. $1,350^\circ$
C. 675°
D. 337.5°
E. 225°
16. The radius of a circle is $\frac{32}{\pi}$ centimeters. What is the area of the circle?
- F. 64
G. 32π
H. $\frac{1,024}{\pi}$
J. 1,024
K. $1,024\pi$